Amendments to the Specification:

Please amend the paragraph at page 1, line 7, as follows:

This application is a divisional of U.S. Serial No. 09/933,993, filed August 20, 2001, which is a continuation-in-part of U.S. ~~patent application for Microfluidic Device with Sample Injector,~~ Serial No. 09/780,638, filed February 10, 2001, which in turn claims priority to U.S. provisional patent applications Serial No. 60/182,049 filed February 11, 2000 and Serial No. 60/185,035, filed February 25, 2000, all of which are incorporated herein by reference.

Please amend the paragraph at page 2, line 21, as follows:

In one aspect, the invention includes a microfluidics system for use in electrophoretic separation of components having a given negative or positive charge and contained in a dilute sample. The system includes a microfluidics device having a substrate and a channel network formed therein. The channel network has a separation channel and first and second side channels that intersect the separation channel at axially spaced positions therealong. The two side channels partition the separation microchannel, in an upstream to downstream direction, into an upstream channel region upstream of intersection with the first side channel, a sample-volume channel region between the intersections of the two side channels, and a downstream separation channel region downstream of the second side channel intersection. The ratio of the lengths of the sample-volume region to the downstream separation channel is between about 1:50 to 1:1.

Please amend the paragraph at page 3, line 3, as follows:

The channel network is designed to be loaded initially by filling the upstream channel region with a trailing-edge electrolyte, filling the sample-volume channel region with the dilute sample, and filling the downstream separation channel region, with a leading-edge (LE) electrolyte.

Please amend the paragraph at page 3, line 14, as follows:

A control unit in the system includes a power source for applying a voltage potential across the upstream and downstream electrodes, under conditions such that, with the upstream channel region filled with a trailing-edge electrolyte, the sample-volume channel region filled with the dilute sample, and the downstream separation channel region filled with a leading-edge electrolyte, the sample stacks into a relatively small sample volume before hydroxyl- or hydrogen-ion migration into and through the sample-volume region is effective to overtake the charged sample components, wherein continued application of an electric potential across the channel ends causes charged sample components in the stacked sample volume to separate by zone electrophoresis.

Please amend the paragraph at page 4, line 13, as follows:

The system may be used to detect charged sample components present at nanomolar concentrations or less, where the ratio of the lengths of the sample-volume region to the downstream separation channel in the device is between about 1:50 to 1:1.

Please amend the paragraph at page 5, line 6, as follows:

In another aspect, the invention includes a method of separating components having a given negative or positive charge and contained in a dilute sample. Initially a separation microchannel having, in an upstream to downstream direction, an upstream channel region, a sample-volume channel region, and a downstream separation channel region, is loaded so as to fill the upstream channel region with a trailing-edge electrolyte containing a selected concentration of a titratable species, the sample-volume channel region, with the dilute sample, and the downstream separation channel region, with a leading-edge electrolyte.

Please amend the paragraph at page 6, line 25, as follows:

The ratio of the lengths of the sample-volume region to the downstream separation channel is preferably between about 1:50 to 1:1, more preferably between about 1:10 to 1:2.

Please amend the paragraph at page 9, line 8, as follows:

One exemplary system in accordance with the invention is shown at 22 in Fig. 1. The system includes a microfluidics device 24 having formed therein one or more channel networks, such as network 26 composed of a separation microchannel 26 having, in an upstream to downstream direction, an upstream channel region 27, a sample-volume channel region 28, and a downstream separation channel region 30. The sample-loading region is defined, at its upstream end, by a first side channel 32 and a second side channel 34 which intersects the separation channel at axial spaced positions, as indicated. More specifically, the length of the sample-loading region *d* is measured as the distance between the upstream side of the first channel, or a first-channel region close to the upstream side, and the downstream side of the second channel, or a region adjacent the downstream channel side, as shown. The downstream separation region has a length *d'*. In preferred embodiments of the invention, the ratio of the lengths of the sample-volume region to the downstream separation channel in the device, *d:d'*, is between about 1:50 to 1:1.